

Egg as a Cell



STANDARD 3200-03 Students will understand structure and function of cells and organisms.

OBJECTIVE 3200-0302 Investigate cellular structures and functions.

Intended Learning Outcomes:

- 1a, d. Make observations, measurements, estimations and predictions based on current knowledge.
- 2a. Identify variables and describe relationships between them.
- 5a. Know science terminology appropriate to grade level.
- 6d. Construct tables, graphs, charts, diagrams, and models to describe and summarize data.
- 7c. Understand that all science is based on observation of natural phenomena, but that all observations are influenced by the observer's prior knowledge, experience, and theoretical perspective.

Background:

- Learner should know the main parts of a cell.
- Learner should understand particle movement.

Summary:

Students will use eggs as cell models and demonstrate osmosis.

Students will measure and observe the changes in the mass and size of the egg.

Introduction:

In order to make his shows more entertaining to the public, Mr. Barnum of Barnum and Bailey Circus, decided to collect whales from the ocean and display them for his audience. He collected the whales and kept them in large uncovered tanks until showtime. Unfortunately, it rained the opening day of his show. The salt water in the tanks, which held the whales, was diluted by the rain that fell that day. This change in the amount of salt in the water compared to the amount of water, caused the death of the whales. Unwilling to admit to his audience that the whales were dead, he told them that that day's rain would cause the cancellation of the show. Not to fear, he would give everyone a check that would allow them to see the next whale show. He would give them a rain check. Mr. Barnum is credited with coining the phrase "rain check". What does the death of Mr. Barnum's whales have to do with the following activity on osmosis?

Materials:

- Three 400 mL beakers
- string
- vinegar
- measuring tape or meter stick
- Karo syrup
- salt
- distilled water
- eggs
- triple beam balance

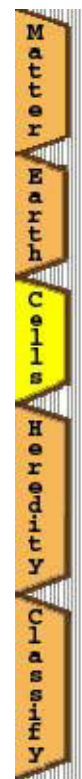
Safety concerns:



Teachers and students, be sure to keep all Glass, Chemical, and Sharp instrument Safety Rules that are specified by the teacher and in all general laboratory experiences.

Student Procedures:

Egg-Speriment





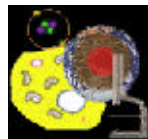
Stage 1

1. Place 3 eggs in a beaker of vinegar. Let eggs remain in beaker keeping eggs completely covered for 1 - 3 days or until the vinegar has "eaten" away the shell of the egg.
2. Remove eggs from vinegar, rinse off. Determine the mass and record on a chart.



Stage 2

- Measure out equal amounts of distilled water, karo syrup and salt water into beakers (or student suggested liquids). Place 1 egg in each beaker and cover the beaker with plastic wrap. Record volume of liquids.
- Daily determine the mass of the egg and record.
- Conclude experiment in 1 -5 days. Take final measurements: mass and volume of liquid.
- Discuss answers to these questions:
 - Which egg is the largest?
 - What other measurable differences exist between the eggs?
 - Which egg is the smallest?
 - Why is it smaller than the others?
 - How much liquid was left in each container?
 - Why did the amounts of liquid vary?
 - How can the egg represent a model of a cell with cell membrane?
 - Is this involved in this activity process diffusion or osmosis?
 - Explain your answer.



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Updated June 15, 2000 by: [Glen Westbroek](#)

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